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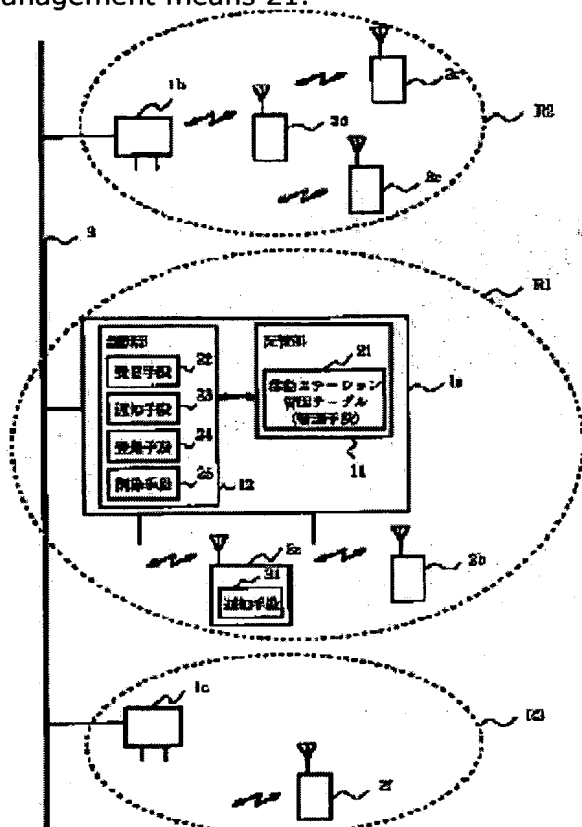
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Abstract:

PROBLEM TO BE SOLVED: To prevent wasteful transmission from an access point in a radio LAN system where plural access points are installed and radio communication is performed between each of the points and a mobile station. **SOLUTION:** Each of access points 1a-1c is provided with a management means 21 managing the identifiers of mobile stations being communication opposite parties. When a mobile station 2a which the point 1b manages moves to the communication possible area R1 of the point 1a and a notice means 31 transmits the self-identifier, a notice means 23 transmits the identifier to all the other points based on the fact that a management means 21 does not manage the identifier that a reception means 22 receives in the point 1a and a registration means 24 registers the identifier in the management means 21. When in the point 1b, the identifier that the management means 21 manages is received from the other point 1a, a deletion means 25 deletes the identifier from the management means 21.



JPO Machine translation abstract:

(57) Abstract

SUBJECT Two or more access points are provided and the useless transmission from an access point is prevented with the wireless LAN system in which each point and a move station carry out radio.

Means for Solution Each access points 1a-1c are provided with the management tool 21 which manages an identifier of a move station made into a communications partner, For example, if the move station 2a which the point 1b manages moves to the communication feasible region R1 of the point 1a and transmits a self identifier by the reporting means 31, On the point 1a, based on not having managed the identifier concerned which the reception means 22 received by the management tool 21, the reporting means 23 transmits the identifier concerned to other points of all the, and the registration means 24 registers the identifier concerned into the management tool 21. On the point 1b, if an identifier managed by the management tool 21 is received from other points 1a, the deleting means 25 will delete the identifier concerned from the management tool 21.

Claim(s)

Claim 1A wireless LAN system which provides two or more access points and in which each access point carries out information and telecommunications on radio between move stations

which exist in a communication feasible region, comprising:

A management tool which manages an identifier of a move station which makes said each access point a communications partner while said move station is provided with a reporting means which transmits a self identifier.

A reception means which receives said identifier from a move station.

A reporting means which transmits the identifier concerned to other access points of all the based on having received identifiers other than an identifier managed by said management tool from a move station.

A registration means to register the identifier concerned into the management tool concerned based on having received identifiers other than an identifier managed by said management tool from a move station, A deleting means which deletes the identifier concerned from the management tool concerned based on having received an identifier of a move station corresponding to an identifier managed by said management tool from other access points.

Detailed Description of the Invention

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Field of the Invention About the wireless LAN system which provides two or more access points and in which each access point carries out information and telecommunications on radio in this invention between the move stations which exist in a communication feasible region (service area), The identifier (ID) of the move station which each access point makes a communications partner especially using communication between access points is managed. Therefore, for example, even if it is a case where a move station moves to the communication feasible region of other access points from the communication feasible region of the access point of 1, In the access point concerned of 1, it is related with the wireless LAN system which performs deleting the identifier of the move station concerned from an administration object promptly (roaming).

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Description of the Prior Art In the wireless LAN system, two or more access points are connected and provided via a wire circuit, for example, and it is performed that each access point carries out information and telecommunications on radio between the move stations which exist in each communication feasible region. Here, interference of the radio signal between the access points which approached is prevented by assigning the radio medium which each access point has an interval mutually, and is installed, for example, for example, is used as a transmission medium for every access point.

0003 Carrying out radio between the access points which approached at the movable move station is performed, For example, when two or more move stations exist in the communication feasible region of the access point of 1, the radio medium assigned to the access point concerned of 1 by the move station of these plurality is shared, and radio is performed.

0004 The composition for which each access point registers the identifier of the move station consider that exists, for example in the communication feasible region of each access point in the above-mentioned wireless LAN system can be considered, In this case, in each access point, when the identifier of the move station corresponding to the address of the information transmitted via the wire circuit above-mentioned, for example is registered, carrying out wireless transmission of the information concerned is performed. By using such composition, not only the information and telecommunications between the move stations accommodated, for example in the same access point but the information and telecommunications between the move stations accommodated in a different access point are realized with the above-mentioned wireless LAN system.

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Problem(s) to be Solved by the Invention However, in the above wireless LAN systems. For example, since it is undetectable that the move station where the identifier was registered has moved to the communication feasible region of other access points under the condition that it exists in the communication feasible region of the access point of 1, For example, even if it was a case where the move station concerned had moved to the outside of the communication feasible region of said access point of 1, there was fault that wireless transmission of the information addressed to the move station concerned will be carried out from said access point

of 1. Since the information signal addressed to said move station by which wireless transmission is carried out between non-railroad sections from said access point of 1 becomes useless when such fault occurs, It had arisen that the throughput of the information and telecommunications between the access point and move station which are performed using a radio medium falls, and will originate in this and the performance of the information and telecommunications as the whole system will also fall.

0006It is what was made in order that this invention might solve such conventional SUBJECT, For example, even if it is a case where the move station managed as a communications partner of the access point of 1 has moved to the communication feasible region of other access points from the communication feasible region of the access point of 1 concerned, It aims at providing the wireless LAN system which can prevent promptly that the information addressed to the move station concerned will continue from said access point of 1, and wireless transmission will be carried out vainly.

0007Specifically by this invention, transmission of the useless above radio signals is promptly prevented from being performed by each access point by managing the identifier of the move station which each access point makes a communications partner using communication between access points.

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Means for Solving the ProblemIn order to attain the above-mentioned purpose, in a wireless LAN system concerning this invention. It performs that provide two or more access points, face that each access point carries out information and telecommunications on radio between move stations which exist in a communication feasible region, and each access point manages an identifier of a move station as follows.

0009Namely, while a reporting means transmits an identifier of the move station concerned at a move station, Each access point is equipped with a management tool which manages an identifier of a move station made into a communications partner, and it performs that a reception means receives said identifier from a move station in each access point concerned. In each access point, if identifiers other than an identifier managed, for example by said management tool are received from a move station, it will perform that a registration means registers the identifier concerned into the management tool concerned, and will perform that a reporting means transmits the identifier concerned to other access points of all the. In each access point, if an identifier of a move station corresponding to an identifier managed, for example by said management tool is received from other access points, it will perform that a deleting means deletes the identifier concerned from the management tool concerned.

0010Even if it is a case where a move station where it existed, for example in a communication feasible region of an access point of 1, and an identifier was managed by the access point concerned of 1 as a communications partner in such composition has moved to a communication feasible region of other access points, the access point concerned of 1 -- being concerned -- others -- it can judge that an identifier of said move station which received from an access point is managed by a management tool, and the identifier concerned can be deleted from the management tool concerned.

0011Therefore, in the above-mentioned access point of 1, since wireless transmission to a move station corresponding to an identifier deleted, for example from a management tool is suspended, it can prevent promptly transmitting a useless radio signal between non-railroad sections. Thus, in this invention, efficient information and telecommunications are realizable by managing an identifier of a move station which each access point makes a communications partner using communication between access points.

0012As an identifier of a move station, as long as it can pinpoint each move station, what kind of thing may be used. As the number of access points with which a wireless LAN system of this invention is equipped, as long as it is plurality, there may not be any limitation in particular and they may be numbers arbitrary as the number of move stations.

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Embodiment of the InventionOne working example concerning this invention is described with reference to Drawings. As an example of the device which constitutes the wireless LAN system concerning this invention in drawing 1, Two or more access points 1a-1c and two or more move stations 2a-2f are shown, and the communication feasible regions (basic service area: BSA) R1-R3 of each access points 1a-1c are shown in the figure. Each access points 1a-1c are devices which carry out information and telecommunications on radio among the move stations 2a-2f which exist, for example in each communication feasible regions R1-R3, and each access points 1a-1c are connected and installed via the circuit 3 of a cable. Thus, each access

points 1a-1c are bearing the role equivalent to the bridge which connects each communication feasible regions R1-R3 and backbone LAN.

0014Each move stations 2a-2f are devices which carry out information and telecommunications among other move stations 2a-2f via the radio between the access points 1a-1c, and are movable devices. Although only the part of two or more devices which constitute the wireless LAN system of this example was shown in above-mentioned drawing 1 here, Move stations other than two or more move station 2a-2f which each above-mentioned access points 1a-1c are connected with other access points for example, besides a figure, and was described above also as a move station, for example also exist out of a figure.

0015The radio medium which the radio medium which is a transmission medium is assigned to each access point 1a - every 1c in this example, and was assigned to each access points 1a-1c, For example, it is shared by many move stations 2a-2f which exist in the communication feasible regions R1-R3 of each access points 1a-1c concerned. The message channel used in order that the radio medium used for the information and telecommunications between each access points 1a-1c and each move stations 2a-2f may transmit information in this example, It is divided into the request channel which requires assignment of a message channel, and the response channel which performs the response to the demand concerned, and is used. The peculiar identifier is assigned to each access points 1a-1c and each move stations 2a-2f, and the identifier of the device of a transmitting agency or a transmission destination is made to include as header information in this example in the information signal using each channel.

0016Here, the access points 1a-1c and move stations 2a-2f above-mentioned example of an equipment configuration is explained in detail. Since the composition of each access points 1a-1c is almost the same in this example, These are summarized, the equipment configuration is explained as the access point 1, and similarly, by this example, since each move stations 2a-2f composition is almost the same, it summarizes these and explains the equipment configuration as the move station 2. The detailed example of composition is shown in above-mentioned drawing 1 only about the one access point 1a and the one move station 2a, and the graphic display of the detailed example of composition is omitted about other devices 1b-1c and 2b-2f.

0017The access point 1 is equipped with the storage parts store 11 which memorizes information, and the control section 12 which performs various kinds of processings, control, etc. It comprises a memory which stores information by the control section 12 enabling free reading and writing, and, as for the storage parts store 11, the move station management table 21 which manages the identifier etc. of the move station 2 which the access point 1 concerned makes a communications partner is stored in the storage parts store 11 concerned.

0018An example of the mode which stores an example, an identifier, etc. of a format of the move station management table 21 is shown in drawing 2, and to the move station management table 21 of this example. The contents of the offset which shows the number assigned one by one to the move station used as the communications partner of the access point 1 concerned, It is made to correspond to the contents of the move station identifier which shows the identifier of the move station of the communications partner concerned, and the contents of the connection timer which shows a connected state with the move station of the communications partner concerned, and is stored. Here, the details of a connection timer are mentioned later. The management tool which manages the identifier of the move station made into a communications partner with such a move station management table 21 comprises this example, and it has such a management tool for every access point.

0019The control section 12 comprises ROM, a memory, etc. which stored CPU, the self identifier, etc., and various kinds of processings and control in the access point 1 concerned are performed in this example by executing the predetermined control program with which CPU was stored in ROM. A function called a modulator, a demodulator, etc. which perform information and telecommunications to the control section 12 between the move stations 2 which exist in the communication feasible region of self with a radio signal using an antenna, It has a function called a modulator, a demodulator, etc. which perform information and telecommunications among other access points via the circuit 3. The reception means 22 which receives the identifier of a move station to the move station concerned is constituted from this example by the function to perform the above-mentioned radio.

0020The reporting means 23 which transmits the identifier of the predetermined move station 2 to other access points of all the at the control section 12 of this example, It has a registration means 24 to register the identifier of the move station 2 into the move station management table 21, and the deleting means 25 which deletes the identifier of the move station 2 from the move station management table 21.

0021Have the reporting means 23 and the function which transmits the identifier concerned to other access points of all the based on identifiers other than the identifier managed with the move station management table 21 by the reception means 22 having been received from the move station 2 in this example. This transmitting processing is performed by including in the frame which mentions the identifier of the move station 2 concerned later, and transmitting via the circuit 3. By processing which searches whether the identifier of the move station 2 received, for example and the identifier in agreement are stored as a move station identifier in the move station management table 21 in the reporting means 23. When the identifier concerned is not stored in the move station management table 21 concerned, it judges that they are identifiers other than the identifier which the identifier of said move station 2 has managed with the move station management table 21 concerned.

0022An example of the format of the frame 41 transmitted to other access points of all the by the reporting means 23 as mentioned above is shown in drawing 3, The preamble (PA) 42 used for this frame 41 from a head at establishment of a bit synchronization, The frame start delimiter (SFD) 43 used in order to identify the start of the frame 41, The destination address (DA) 44 which shows an address, and the transmission source address (SA) 45 which shows a transmitting agency, The identifier 46 for communication between access points which shows the classification of the information included by the frame 41 concerned, The variable-length send data 47 including the information to transmit, pad (PAD)48 which show the contents of padding, and the frame check sequence (FCS) 49 which performs detection of a transmission error are included. Since Ethernet and IEEE802.3 were DIFAKU toss tongue DADO, this example usually constituted the frame 41 above-mentioned almost according to this from the LAN interface of the cable, but. It may not be restricted to the mode of this example, but information and telecommunications may be performed in what kind of mode between access points.

0023When the above-mentioned reporting means 23 transmits the identifier of the move station 2 to other access points of all the, The identifier of the move station 2 which is a candidate for a notice is included in the send data 47 which the contents made into an address were included and described above all the access points of the others connected to backbone LAN in the destination address 44 which constitutes the above-mentioned frame 41. In the reporting means 23, the frame 41 concerned is transmitted to other access points of all the by transmitting the frame 41 which was carried out in this way and generated via the circuit 3 (broadcasting).

0024If it is considered as the identifier which pinpoints each access point 1 and each move station 2, the address assigned to each of these devices may be used, and as an identifier, As long as it can specify each device, other information other than an address may be used as an identifier.

0025The registration means 24 has the function to register the identifier concerned into the move station management table 21 concerned based on identifiers other than the identifier managed with the move station management table 21 by the reception means 22 having been received from the move station 2. The judgment of whether to be identifiers other than the identifier managed with the move station management table 21 is performed like the case of the above-mentioned reporting means 23.

0026When it stores **the registration means 24 of this example** the identifier of the move station 2 as a move station identifier in the move station management table 21, while making it correspond to the identifier concerned and storing the number of registration in offset, Storing the specific time beforehand set as the connection timer to the move station 2 concerned as the initial value is performed. Here, the details of specific time are mentioned later.

0027The deleting means 25, It has the function to delete the identifier concerned from the move station management table 21 concerned based on having been received from other access points by the frame 41 which the identifier of the move station 2 corresponding to the identifier managed with the move station management table 21 described above. By processing which searches whether the identifier of the move station 2 received, for example and the identifier in agreement are stored as a move station identifier in the move station management table 21 in the deleting means 25. When the identifier concerned is stored in the move station management table 21 concerned, the identifier of said move station 2 judges that it is the identifier managed with the move station management table 21 concerned.

0028In the deleting means 25 of this example, when deleting the identifier of the move station 2 from the move station identifier in the move station management table 21, deleting also about the contents stored in the offset and the connection timer corresponding to the identifier

concerned is performed.

0029The deleting means 25 of this example has a timer which clocks time, for example, Each time stored as a connection timer in the move station management table 21 For example, the function rewritten and reduced for every fixed time, When wireless information is received from the move station 2 corresponding to what has the bigger time stored as a connection timer than 0, it is an initial value (in this example.) about the time of the connection timer concerned. It has the function to delete the contents of the identifier of the move station 2 and offset corresponding to that from which the function again reset up at the above-mentioned specific time and the time stored as a connection timer were set to 0, and the connection timer from the move station management table 41.

0030With such a function, in the deleting means 25 of this example. Based on the thing to which the wireless information from the move station 2 managed as a communications partner was set to the move station 2 concerned with the move station management table 21 and which was not done for specific time reception, Deleting the identifier of the move station 2 concerned, etc. from the object of the communications partner managed with the move station management table 21 concerned is performed. Time which could be arbitrarily set up according to the operating condition of a system, etc. as specific time, for example, is different every move station 2 may be set up as specific time.

0031the function which transmits the information concerned to other access points via the circuit 3 when the identifier of the move station corresponding to the address of the information which carried out radio receiving to the control section 12, for example from the move station 2 is not managed with the move station management table 21 of self. For example, when the address of the information transmitted via the circuit 3 is detected and the identifier of the move station 2 corresponding to the address concerned is managed with the move station management table 21 of self, it has the function which carries out wireless transmission of the information concerned. Carrying out information and telecommunications mutually via radio with these access points with such a function between the move stations which exist in the communication feasible region of an access point different, for example is realized.

0032By the above composition, in the access point 1. While carrying out information and telecommunications on radio between the move stations 2 which exist in the communication feasible region of self, For example, managing the identifier of the move station 2 which exists in the communication feasible region of self and self makes a communications partner with the move station management table 21 is performed, According to the information etc. which were received from the move station 2 or other access points, processings, such as registration of the identifier to the move station management table 21, etc., deletion, transmission of said frame 41 to other access points of all the, are performed.

0033As described above, each function means 21-25 which manage the identifier of the move station 2 made into a communications partner based on communication with other access points, etc. comprise the access point 1 of this example, when CPU executes a control program, but. It may comprise this invention as hardware circuitry where it may be what kind of thing as composition of each function means 21-25 which perform the processing concerned, for example, each function means 21-25 became independent.

0034The move station 2 is equipped with the control section which performs a function, various kinds of processings, control, etc. which are called a modulator, a demodulator, etc. which perform information and telecommunications between the access points 1 with a radio signal using an antenna. The control section comprises ROM, a memory, etc. which stored CPU, the self identifier, etc., and various kinds of processings and control in the move station 2 concerned are performed in this example by executing the predetermined control program with which CPU was stored in ROM.

0035This control section is equipped with the reporting means 31 which transmits by the radio function which described the self identifier above in this example. By such composition, carrying out information and telecommunications on radio between the access points 1 which can communicate is performed, and transmitting a self identifier to the access point 1 is performed on the occasion of the communication concerned at the move station 2.

0036The reporting means 31 which performs transmitting processing of an identifier comprises the move station 2 of this example, when CPU executes a control program, but. It may comprise this invention as hardware circuitry where it may be what kind of thing as composition of the function means 31 which performs the processing concerned, for example, the function means 31 concerned became independent.

0037Next, an example of the procedure of various kinds of processings performed by the

access points 1a-1c shown in above-mentioned drawing 1 is explained. By this example, since the processing operation performed by each access points 1a-1c is almost the same, it summarizes these and explains the processing operation as the access point 1. By this example, since the processing operation performed by each move stations 2a-2f is almost the same, it explains these as the move station 2 collectively **processing operation** below.

0038An example of the procedure of the connection processing of the move station 2 performed by the access point 1 is shown in drawing 4, and processing etc. which register identifiers, such as a move station which went into the communication feasible region of self, for example, as a communications partner are performed in this connection processing. In the access point 1, whenever it receives information, for example from the move station 2, the processing operation concerned is started every (Step S1). For example, if the information on a connection request transmitted via the request channel from the move station 2 is received (Step S2), the identifier of the move station 2 concerned included by the header information in the information concerned will be extracted, The identifier concerned and an identifier in agreement are searched in the identifier managed with the move station management table 21 (Step S3).

0039When the identifier which is in agreement with the identifier which received, for example from the move station 2 by this search in the access point 1 is not registered into the move station management table 21 (when the identifier concerned is not found), While judging that it is new connection and registering the identifier of the move station 2 concerned, and the contents of offset into the move station management table 21 (step S4), It is made to correspond to the identifier concerned etc. and predetermined specific time is registered as an initial value of the connection timer in the move station management table 21 concerned (Step S5). In this case, the frame 41 shown in above-mentioned drawing 3 is made to include the registered identifier, it transmits to other access points of all the, and this ends the connection processing concerned in the access point 1 (Step S7).

0040In the access point 1, information is received, for example from the move station 2 (Step S2), When it is searched whether the identifier which extracts the identifier of the move station 2 concerned out of the received information, and is in agreement with the identifier concerned is registered into the move station management table 21, (Step S3), If it is judged that the identifier concerned is registered into the move station management table 21, it will reset the time of the connection timer corresponding to the identifier concerned to an initial value (this example specific time) (Step S6), and, thereby, will end the processing concerned (Step S7).

0041By the above processings, in the access point 1. For example, when the case where the power supply of the move station 2 is made one in the communication feasible region of self, and the move station 2 have moved to the communication feasible region of self from the communication feasible region of other access points, Receiving the information on a connection request transmitted from such a move station 2, and registering the identifier of the move station 2 concerned into the move station management table 21 as an object of a communications partner is performed. In the access point 1, when information is received from the move station 2 corresponding to the identifier already registered into the move station management table 21, resetting the time of the connection timer stored to the move station 2 concerned to an initial value is performed.

0042An example of the procedure of move station management processing using the connection timer performed by the access point 1 is shown in drawing 5. In the access point 1, the processing operation concerned is started for every fixed time set up beforehand, for example (Step S11), First, the thing which are equivalent to the fixed time concerned, respectively in the time of the connection timer managed corresponding to each identifier stored in the move station management table 21 and which is made to decrease by time is performed (Step S12).

0043And it is searched whether in the access point 1, there are some (or it became smaller than 0) which were set to zero among the time stored as a connection timer in the move station management table 21 (Step S13), When there are some (or it became smaller than 0) from which the time of the connection timer was set to 0, the identifier corresponding to the time concerned, etc. are deleted from the move station management table 21 (Step S14), and this ends the processing concerned (Step S15). Also when there is that **no** from which the time of the connection timer was set to 0 (Step S13), the processing concerned is ended in the access point 1 (Step S15).

0044By the above processings, in the access point 1. For example, when the identifier of the move station 2 which exists in the communication feasible region of self is managed with the

move station management table 21, Even if the move station 2 concerned has moved to the communication feasible region of other access points, Based on not having carried out specific time reception of the radio signal from the move station 2 concerned, the identifier of the move station 2 concerned can be deleted from the move station management table 21.

0045In the move station management processing using such a connection timer. For example, when the move station 2 moves to the communication feasible region of other access points from the communication feasible region of the access point of 1, in said access point of 1. In order to transmit vainly the radio signal addressed to the move station 2 concerned until the time of the connection timer corresponding to the move station 2 concerned was set to 0, some of the effect is low at the point of raising the throughput of radio.

0046In the move station management processing using communication between the access points concerning this invention shown below. A very big effect is done so in that a useless radio signal can be more promptly prevented from being transmitted from an access point compared with the management processing using the above-mentioned connection timer.

0047An example of the procedure of processing at the time of receiving the frame 41 shown in above-mentioned drawing 3 from other access points as an example of the procedure of move station management processing which used communication between such access points is shown in drawing 6. As described above, in the access point 1. For example, when the identifier of the move station 2 to the move station 2 concerned moved to the communication feasible region of self from the communication feasible region of other access points is received, transmitting the identifier concerned to other access points of all the by the above-mentioned frame 41 is performed.

0048In the access point 1, for example always supervising the information from other access points is performed (Step S21), For example, if the frame (communication frame between access points) 41 which included the identifier 46 for communication between access points from other access points is received (Step S22), It is judged whether the identifier of the move station 2 is extracted out of the frame 41 concerned (Step S23), and the extracted identifier and an identifier in agreement are registered into the move station management table 21, and are managed (Step S24).

0049By the above-mentioned judgment, in the access point 1. For example, when it is judged that the extracted identifier and the identifier in agreement are managed with the move station management table 21, the identifier concerned etc. are promptly deleted from the move station management table 21 (Step S25), and this ends the processing concerned. In the access point 1, also when judged with the identifier extracted, for example and the identifier in agreement not being managed with the move station management table 21, the processing concerned is ended (Step S26).

0050By the above processings, in the access point 1. For example, even if it is a case where the move station 2 corresponding to the identifier managed as a communications partner with the move station management table 21 has moved to the communication feasible region of other access points from the communication feasible region of self, being concerned -- others, since the identifier concerned can be promptly deleted from the move station management table 21 by the communication frame 41 between access points received from the access point, It can suspend promptly transmitting vainly the radio signal to the move station 2 corresponding to the identifier concerned between non-railroad sections. Thereby, the throughput of the radio between each access point 1 and each move station 2 can be maintained highly, for example, and the performance of the information and telecommunications as the whole system can also be raised.

0051When registering the identifier of the move station 2 into the move station management table 21 in the access point 1 of this example, Since what is necessary is just to transmit the frame 41 concerned to other access points of all the, without specifying the address of the communication frame 41 between access points which included the identifier concerned, useless radio can be prevented as described above by very simple processing.

0052Since the management tool 21 which manages the identifier of the move station 2 made into a communications partner for every access point in this example is established, Also in the case where the access point with which the case where a new access point is added to a system, and the system were equipped is deleted etc., For example, since it is not necessarily required for a router etc. for additional registration etc. to carry out the identifiers (address etc.) of an access point, there is also an advantage that the design variation of a system can be performed easily.

0053Although above-mentioned working example showed here the case where management

processing of the move station using communication between the access points concerning this invention and management processing of the move station using a connection timer were used together and carried out, This invention may be performed separately from the move station management processing which used the connection timer, for example. In this case, an access point does not need to be equipped with the function to perform move station management processing which used the connection timer, for example.

0054In above-mentioned working example, while performing radio between the access point and the move station, between an access point and other access points, the composition which carries out information and telecommunications via the circuit of a cable was shown, but. For example, the composition to which radio is carried out may be used between an access point and other access points. As the number of the access point with which a wireless LAN system is equipped, or move stations, it may not necessarily be restricted to what was shown in above-mentioned working example, but the wireless LAN system of this invention may be built with various composition.

0055

Effect of the InventionAs explained above, according to the wireless LAN system concerning this invention, provide two or more access points and it faces that each access point carries out information and telecommunications on radio between the move stations which exist in a communication feasible region, For example, even if it is a case where the move station corresponding to the identifier managed by the access point of 1 as a communications partner has moved to the communication feasible region of other access points from the communication feasible region of the access point of 1 concerned, being concerned -- others -- by transmitting the identifier of the move station concerned to other access points of all the from an access point, In said access point of 1, since the identifier of the move station concerned was promptly deleted from the object of the communications partner, the radio signal from the access point concerned of 1 to said move station can be promptly prevented from being transmitted vainly.

Field of the InventionThis invention about the wireless LAN system which provides two or more access points and in which each access point carries out information and telecommunications on radio between the move stations which exist in a communication feasible region (service area), By managing the identifier (ID) of the move station which each access point makes a communications partner especially using communication between access points, For example, even if it is a case where a move station moves to the communication feasible region of other access points from the communication feasible region of the access point of 1, In the access point concerned of 1, it is related with the wireless LAN system which performs deleting the identifier of the move station concerned from an administration object promptly (roaming).

Description of the Prior ArtIn the wireless LAN system, two or more access points are connected and provided via a wire circuit, for example, and it is performed that each access point carries out information and telecommunications on radio between the move stations which exist in each communication feasible region. Here, interference of the radio signal between the access points which approached is prevented by assigning the radio medium which each access point has an interval mutually, and is installed, for example, for example, is used as a transmission medium for every access point.

0003Carrying out radio between the access points which approached at the movable move station is performed, For example, when two or more move stations exist in the communication feasible region of the access point of 1, the radio medium assigned to the access point concerned of 1 by the move station of these plurality is shared, and radio is performed.

0004The composition for which each access point registers the identifier of the move station consider that exists, for example in the communication feasible region of each access point in the above-mentioned wireless LAN system can be considered, In this case, in each access point, when the identifier of the move station corresponding to the address of the information transmitted via the wire circuit above-mentioned, for example is registered, carrying out wireless transmission of the information concerned is performed. By using such composition, not only the information and telecommunications between the move stations accommodated,

for example in the same access point but the information and telecommunications between the move stations accommodated in a different access point are realized with the above-mentioned wireless LAN system.

Effect of the InventionAs explained above, according to the wireless LAN system concerning this invention, provide two or more access points and it faces that each access point carries out information and telecommunications on radio between the move stations which exist in a communication feasible region, For example, even if it is a case where the move station corresponding to the identifier managed by the access point of 1 as a communications partner has moved to the communication feasible region of other access points from the communication feasible region of the access point of 1 concerned, being concerned -- others -- by transmitting the identifier of the move station concerned to other access points of all the from an access point, In said access point of 1, since the identifier of the move station concerned was promptly deleted from the object of the communications partner, the radio signal from the access point concerned of 1 to said move station can be promptly prevented from being transmitted vainly.

Problem(s) to be Solved by the InventionHowever, in the above wireless LAN systems. For example, since it is undetectable that the move station where the identifier was registered has moved to the communication feasible region of other access points under the condition that it exists in the communication feasible region of the access point of 1, For example, even if it was a case where the move station concerned had moved to the outside of the communication feasible region of said access point of 1, there was fault that wireless transmission of the information addressed to the move station concerned will be carried out from said access point of 1. Since the information signal addressed to said move station by which wireless transmission is carried out between non-railroad sections from said access point of 1 becomes useless when such fault occurs, It had arisen that the throughput of the information and telecommunications between the access point and move station which are performed using a radio medium falls, and will originate in this and the performance of the information and telecommunications as the whole system will also fall.

0006It is what was made in order that this invention might solve such conventional SUBJECT, For example, even if it is a case where the move station managed as a communications partner of the access point of 1 has moved to the communication feasible region of other access points from the communication feasible region of the access point of 1 concerned, It aims at providing the wireless LAN system which can prevent promptly that the information addressed to the move station concerned will continue from said access point of 1, and wireless transmission will be carried out vainly.

0007Specifically by this invention, transmission of the useless above radio signals is promptly prevented from being performed by each access point by managing the identifier of the move station which each access point makes a communications partner using communication between access points.

Means for Solving the ProblemIn order to attain the above-mentioned purpose, in a wireless LAN system concerning this invention. It performs that provide two or more access points, face that each access point carries out information and telecommunications on radio between move stations which exist in a communication feasible region, and each access point manages an identifier of a move station as follows.

0009Namely, while a reporting means transmits an identifier of the move station concerned at a move station, Each access point is equipped with a management tool which manages an identifier of a move station made into a communications partner, and it performs that a reception means receives said identifier from a move station in each access point concerned. In each access point, if identifiers other than an identifier managed, for example by said management tool are received from a move station, it will perform that a registration means registers the identifier concerned into the management tool concerned, and will perform that a reporting means transmits the identifier concerned to other access points of all the. In each

access point, if an identifier of a move station corresponding to an identifier managed, for example by said management tool is received from other access points, it will perform that a deleting means deletes the identifier concerned from the management tool concerned.

0010 Even if it is a case where a move station where it existed, for example in a communication feasible region of an access point of 1, and an identifier was managed by the access point concerned of 1 as a communications partner in such composition has moved to a communication feasible region of other access points, the access point concerned of 1 -- being concerned -- others -- it can judge that an identifier of said move station which received from an access point is managed by a management tool, and the identifier concerned can be deleted from the management tool concerned.

0011 Therefore, in the above-mentioned access point of 1, since wireless transmission to a move station corresponding to an identifier deleted, for example from a management tool is suspended, it can prevent promptly transmitting a useless radio signal between non-railroad sections. Thus, in this invention, efficient information and telecommunications are realizable by managing an identifier of a move station which each access point makes a communications partner using communication between access points.

0012 As an identifier of a move station, as long as it can pinpoint each move station, what kind of thing may be used. As the number of access points with which a wireless LAN system of this invention is equipped, as long as it is plurality, there may not be any limitation in particular and they may be numbers arbitrary as the number of move stations.

0013

Embodiment of the Invention One working example concerning this invention is described with reference to Drawings. As an example of the device which constitutes the wireless LAN system concerning this invention in drawing 1, Two or more access points 1a-1c and two or more move stations 2a-2f are shown, and the communication feasible regions (basic service area: BSA) R1-R3 of each access points 1a-1c are shown in the figure. Each access points 1a-1c are devices which carry out information and telecommunications on radio among the move stations 2a-2f which exist, for example in each communication feasible regions R1-R3, and each access points 1a-1c are connected and installed via the circuit 3 of a cable. Thus, each access points 1a-1c are bearing the role equivalent to the bridge which connects each communication feasible regions R1-R3 and backbone LAN.

0014 Each move stations 2a-2f are devices which carry out information and telecommunications among other move stations 2a-2f via the radio between the access points 1a-1c, and are movable devices. Although only the part of two or more devices which constitute the wireless LAN system of this example was shown in above-mentioned drawing 1 here, Move stations other than two or more move station 2a-2f which each above-mentioned access points 1a-1c are connected with other access points for example, besides a figure, and was described above also as a move station, for example also exist out of a figure.

0015 The radio medium which the radio medium which is a transmission medium is assigned to each access point 1a - every 1c in this example, and was assigned to each access points 1a-1c, For example, it is shared by many move stations 2a-2f which exist in the communication feasible regions R1-R3 of each access points 1a-1c concerned. The message channel used in order that the radio medium used for the information and telecommunications between each access points 1a-1c and each move stations 2a-2f may transmit information in this example, It is divided into the request channel which requires assignment of a message channel, and the response channel which performs the response to the demand concerned, and is used. The peculiar identifier is assigned to each access points 1a-1c and each move stations 2a-2f, and the identifier of the device of a transmitting agency or a transmission destination is made to include as header information in this example in the information signal using each channel.

0016 Here, the access points 1a-1c and move stations 2a-2f above-mentioned example of an equipment configuration is explained in detail. Since the composition of each access points 1a-1c is almost the same in this example, These are summarized, the equipment configuration is explained as the access point 1, and similarly, by this example, since each move stations 2a-2f composition is almost the same, it summarizes these and explains the equipment configuration as the move station 2. The detailed example of composition is shown in above-mentioned drawing 1 only about the one access point 1a and the one move station 2a, and the graphic display of the detailed example of composition is omitted about other devices 1b-1c and 2b-2f.

0017 The access point 1 is equipped with the storage parts store 11 which memorizes information, and the control section 12 which performs various kinds of processings, control, etc. It comprises a memory which stores information by the control section 12 enabling free

reading and writing, and, as for the storage parts store 11, the move station management table 21 which manages the identifier etc. of the move station 2 which the access point 1 concerned makes a communications partner is stored in the storage parts store 11 concerned.

0018An example of the mode which stores an example, an identifier, etc. of a format of the move station management table 21 is shown in drawing 2, and to the move station management table 21 of this example. The contents of the offset which shows the number assigned one by one to the move station used as the communications partner of the access point 1 concerned, It is made to correspond to the contents of the move station identifier which shows the identifier of the move station of the communications partner concerned, and the contents of the connection timer which shows a connected state with the move station of the communications partner concerned, and is stored. Here, the details of a connection timer are mentioned later. The management tool which manages the identifier of the move station made into a communications partner with such a move station management table 21 comprises this example, and it has such a management tool for every access point.

0019The control section 12 comprises ROM, a memory, etc. which stored CPU, the self identifier, etc., and various kinds of processings and control in the access point 1 concerned are performed in this example by executing the predetermined control program with which CPU was stored in ROM. A function called a modulator, a demodulator, etc. which perform information and telecommunications to the control section 12 between the move stations 2 which exist in the communication feasible region of self with a radio signal using an antenna, It has a function called a modulator, a demodulator, etc. which perform information and telecommunications among other access points via the circuit 3. The reception means 22 which receives the identifier of a move station to the move station concerned is constituted from this example by the function to perform the above-mentioned radio.

0020The reporting means 23 which transmits the identifier of the predetermined move station 2 to other access points of all the at the control section 12 of this example, It has a registration means 24 to register the identifier of the move station 2 into the move station management table 21, and the deleting means 25 which deletes the identifier of the move station 2 from the move station management table 21.

0021Have the reporting means 23 and the function which transmits the identifier concerned to other access points of all the based on identifiers other than the identifier managed with the move station management table 21 by the reception means 22 having been received from the move station 2 in this example. This transmitting processing is performed by including in the frame which mentions the identifier of the move station 2 concerned later, and transmitting via the circuit 3. By processing which searches whether the identifier of the move station 2 received, for example and the identifier in agreement are stored as a move station identifier in the move station management table 21 in the reporting means 23. When the identifier concerned is not stored in the move station management table 21 concerned, it judges that they are identifiers other than the identifier which the identifier of said move station 2 has managed with the move station management table 21 concerned.

0022An example of the format of the frame 41 transmitted to other access points of all the by the reporting means 23 as mentioned above is shown in drawing 3, The preamble (PA) 42 used for this frame 41 from a head at establishment of a bit synchronization, The frame start delimiter (SFD) 43 used in order to identify the start of the frame 41, The destination address (DA) 44 which shows an address, and the transmission source address (SA) 45 which shows a transmitting agency, The identifier 46 for communication between access points which shows the classification of the information included by the frame 41 concerned, The variable-length send data 47 including the information to transmit, pad (PAD)48 which show the contents of padding, and the frame check sequence (FCS) 49 which performs detection of a transmission error are included. Since Ethernet and IEEE802.3 were DIFAKU toss tongue DADO, this example usually constituted the frame 41 above-mentioned almost according to this from the LAN interface of the cable, but. It may not be restricted to the mode of this example, but information and telecommunications may be performed in what kind of mode between access points.

0023When the above-mentioned reporting means 23 transmits the identifier of the move station 2 to other access points of all the, The identifier of the move station 2 which is a candidate for a notice is included in the send data 47 which the contents made into an address were included and described above all the access points of the others connected to backbone LAN in the destination address 44 which constitutes the above-mentioned frame 41. In the reporting means 23, the frame 41 concerned is transmitted to other access points of all the by

transmitting the frame 41 which was carried out in this way and generated via the circuit 3 (broadcasting).

0024If it is considered as the identifier which pinpoints each access point 1 and each move station 2, the address assigned to each of these devices may be used, and as an identifier, As long as it can specify each device, other information other than an address may be used as an identifier.

0025The registration means 24 has the function to register the identifier concerned into the move station management table 21 concerned based on identifiers other than the identifier managed with the move station management table 21 by the reception means 22 having been received from the move station 2. The judgment of whether to be identifiers other than the identifier managed with the move station management table 21 is performed like the case of the above-mentioned reporting means 23.

0026When it stores **the registration means 24 of this example** the identifier of the move station 2 as a move station identifier in the move station management table 21, while making it correspond to the identifier concerned and storing the number of registration in offset, Storing the specific time beforehand set as the connection timer to the move station 2 concerned as the initial value is performed. Here, the details of specific time are mentioned later.

0027The deleting means 25, It has the function to delete the identifier concerned from the move station management table 21 concerned based on having been received from other access points by the frame 41 which the identifier of the move station 2 corresponding to the identifier managed with the move station management table 21 described above. By processing which searches whether the identifier of the move station 2 received, for example and the identifier in agreement are stored as a move station identifier in the move station management table 21 in the deleting means 25. When the identifier concerned is stored in the move station management table 21 concerned, the identifier of said move station 2 judges that it is the identifier managed with the move station management table 21 concerned.

0028In the deleting means 25 of this example, when deleting the identifier of the move station 2 from the move station identifier in the move station management table 21, deleting also about the contents stored in the offset and the connection timer corresponding to the identifier concerned is performed.

0029The deleting means 25 of this example has a timer which clocks time, for example, Each time stored as a connection timer in the move station management table 21 For example, the function rewritten and reduced for every fixed time, When wireless information is received from the move station 2 corresponding to what has the bigger time stored as a connection timer than 0, it is an initial value (in this example.) about the time of the connection timer concerned. It has the function to delete the contents of the identifier of the move station 2 and offset corresponding to that from which the function again reset up at the above-mentioned specific time and the time stored as a connection timer were set to 0, and the connection timer from the move station management table 41.

0030With such a function, in the deleting means 25 of this example. Based on the thing to which the wireless information from the move station 2 managed as a communications partner was set to the move station 2 concerned with the move station management table 21 and which was not done for specific time reception, Deleting the identifier of the move station 2 concerned, etc. from the object of the communications partner managed with the move station management table 21 concerned is performed. Time which could be arbitrarily set up according to the operating condition of a system, etc. as specific time, for example, is different every move station 2 may be set up as specific time.

0031the function which transmits the information concerned to other access points via the circuit 3 when the identifier of the move station corresponding to the address of the information which carried out radio receiving to the control section 12, for example from the move station 2 is not managed with the move station management table 21 of self. For example, when the address of the information transmitted via the circuit 3 is detected and the identifier of the move station 2 corresponding to the address concerned is managed with the move station management table 21 of self, it has the function which carries out wireless transmission of the information concerned. Carrying out information and telecommunications mutually via radio with these access points with such a function between the move stations which exist in the communication feasible region of an access point different, for example is realized.

0032By the above composition, in the access point 1. While carrying out information and telecommunications on radio between the move stations 2 which exist in the communication feasible region of self, For example, managing the identifier of the move station 2 which exists

in the communication feasible region of self and self makes a communications partner with the move station management table 21 is performed, According to the information etc. which were received from the move station 2 or other access points, processings, such as registration of the identifier to the move station management table 21, etc., deletion, transmission of said frame 41 to other access points of all the, are performed.

0033As described above, each function means 21-25 which manage the identifier of the move station 2 made into a communications partner based on communication with other access points, etc. comprise the access point 1 of this example, when CPU executes a control program, but. It may comprise this invention as hardware circuitry where it may be what kind of thing as composition of each function means 21-25 which perform the processing concerned, for example, each function means 21-25 became independent.

0034The move station 2 is equipped with the control section which performs a function, various kinds of processings, control, etc. which are called a modulator, a demodulator, etc. which perform information and telecommunications between the access points 1 with a radio signal using an antenna. The control section comprises ROM, a memory, etc. which stored CPU, the self identifier, etc.; and various kinds of processings and control in the move station 2 concerned are performed in this example by executing the predetermined control program with which CPU was stored in ROM.

0035This control section is equipped with the reporting means 31 which transmits by the radio function which described the self identifier above in this example. By such composition, carrying out information and telecommunications on radio between the access points 1 which can communicate is performed, and transmitting a self identifier to the access point 1 is performed on the occasion of the communication concerned at the move station 2.

0036The reporting means 31 which performs transmitting processing of an identifier comprises the move station 2 of this example, when CPU executes a control program, but. It may comprise this invention as hardware circuitry where it may be what kind of thing as composition of the function means 31 which performs the processing concerned, for example, the function means 31 concerned became independent.

0037Next, an example of the procedure of various kinds of processings performed by the access points 1a-1c shown in above-mentioned drawing 1 is explained. By this example, since the processing operation performed by each access points 1a-1c is almost the same, it summarizes these and explains the processing operation as the access point 1. By this example, since the processing operation performed by each move stations 2a-2f is almost the same, it explains these as the move station 2 collectively **processing operation** below.

0038An example of the procedure of the connection processing of the move station 2 performed by the access point 1 is shown in drawing 4, and processing etc. which register identifiers, such as a move station which went into the communication feasible region of self, for example, as a communications partner are performed in this connection processing. In the access point 1, whenever it receives information, for example from the move station 2, the processing operation concerned is started every (Step S1), For example, if the information on a connection request transmitted via the request channel from the move station 2 is received (Step S2), the identifier of the move station 2 concerned included by the header information in the information concerned will be extracted, The identifier concerned and an identifier in agreement are searched in the identifier managed with the move station management table 21 (Step S3).

0039When the identifier which is in agreement with the identifier which received, for example from the move station 2 by this search in the access point 1 is not registered into the move station management table 21 (when the identifier concerned is not found), While judging that it is new connection and registering the identifier of the move station 2 concerned, and the contents of offset into the move station management table 21 (step S4), It is made to correspond to the identifier concerned etc. and predetermined specific time is registered as an initial value of the connection timer in the move station management table 21 concerned (Step S5). In this case, the frame 41 shown in above-mentioned drawing 3 is made to include the registered identifier, it transmits to other access points of all the, and this ends the connection processing concerned in the access point 1 (Step S7).

0040In the access point 1, information is received, for example from the move station 2 (Step S2), When it is searched whether the identifier which extracts the identifier of the move station 2 concerned out of the received information, and is in agreement with the identifier concerned is registered into the move station management table 21, (Step S3), If it is judged that the identifier concerned is registered into the move station management table 21, it will reset the

time of the connection timer corresponding to the identifier concerned to an initial value (this example specific time) (Step S6), and, thereby, will end the processing concerned (Step S7).

0041By the above processings, in the access point 1. For example, when the case where the power supply of the move station 2 is made one in the communication feasible region of self, and the move station 2 have moved to the communication feasible region of self from the communication feasible region of other access points, Receiving the information on a connection request transmitted from such a move station 2, and registering the identifier of the move station 2 concerned into the move station management table 21 as an object of a communications partner is performed. In the access point 1, when information is received from the move station 2 corresponding to the identifier already registered into the move station management table 21, resetting the time of the connection timer stored to the move station 2 concerned to an initial value is performed.

0042An example of the procedure of move station management processing using the connection timer performed by the access point 1 is shown in drawing 5. In the access point 1, the processing operation concerned is started for every fixed time set up beforehand, for example (Step S11), First, the thing which are equivalent to the fixed time concerned, respectively in the time of the connection timer managed corresponding to each identifier stored in the move station management table 21 and which is made to decrease by time is performed (Step S12).

0043And it is searched whether in the access point 1, there are some (or it became smaller than 0) which were set to zero among the time stored as a connection timer in the move station management table 21 (Step S13), When there are some (or it became smaller than 0) from which the time of the connection timer was set to 0, the identifier corresponding to the time concerned, etc. are deleted from the move station management table 21 (Step S14), and this ends the processing concerned (Step S15). Also when there is that **no** from which the time of the connection timer was set to 0 (Step S13), the processing concerned is ended in the access point 1 (Step S15).

0044By the above processings, in the access point 1. For example, when the identifier of the move station 2 which exists in the communication feasible region of self is managed with the move station management table 21, Even if the move station 2 concerned has moved to the communication feasible region of other access points, Based on not having carried out specific time reception of the radio signal from the move station 2 concerned, the identifier of the move station 2 concerned can be deleted from the move station management table 21.

0045In the move station management processing using such a connection timer. For example, when the move station 2 moves to the communication feasible region of other access points from the communication feasible region of the access point of 1, in said access point of 1. In order to transmit vainly the radio signal addressed to the move station 2 concerned until the time of the connection timer corresponding to the move station 2 concerned was set to 0, some of the effect is low at the point of raising the throughput of radio.

0046In the move station management processing using communication between the access points concerning this invention shown below. A very big effect is done so in that a useless radio signal can be more promptly prevented from being transmitted from an access point compared with the management processing using the above-mentioned connection timer.

0047An example of the procedure of processing at the time of receiving the frame 41 shown in above-mentioned drawing 3 from other access points as an example of the procedure of move station management processing which used communication between such access points is shown in drawing 6. As described above, in the access point 1. For example, when the identifier of the move station 2 to the move station 2 concerned moved to the communication feasible region of self from the communication feasible region of other access points is received, transmitting the identifier concerned to other access points of all the by the above-mentioned frame 41 is performed.

0048In the access point 1, for example always supervising the information from other access points is performed (Step S21), For example, if the frame (communication frame between access points) 41 which included the identifier 46 for communication between access points from other access points is received (Step S22), It is judged whether the identifier of the move station 2 is extracted out of the frame 41 concerned (Step S23), and the extracted identifier and an identifier in agreement are registered into the move station management table 21, and are managed (Step S24).

0049By the above-mentioned judgment, in the access point 1. For example, when it is judged that the extracted identifier and the identifier in agreement are managed with the move station

management table 21, the identifier concerned etc. are promptly deleted from the move station management table 21 (Step S25), and this ends the processing concerned. In the access point 1, also when judged with the identifier extracted, for example and the identifier in agreement not being managed with the move station management table 21, the processing concerned is ended (Step S26).

0050By the above processings, in the access point 1. For example, even if it is a case where the move station 2 corresponding to the identifier managed as a communications partner with the move station management table 21 has moved to the communication feasible region of other access points from the communication feasible region of self, being concerned -- others, since the identifier concerned can be promptly deleted from the move station management table 21 by the communication frame 41 between access points received from the access point, It can suspend promptly transmitting vainly the radio signal to the move station 2 corresponding to the identifier concerned between non-railroad sections. Thereby, the throughput of the radio between each access point 1 and each move station 2 can be maintained highly, for example, and the performance of the information and telecommunications as the whole system can also be raised.

0051When registering the identifier of the move station 2 into the move station management table 21 in the access point 1 of this example, Since what is necessary is just to transmit the frame 41 concerned to other access points of all the, without specifying the address of the communication frame 41 between access points which included the identifier concerned, useless radio can be prevented as described above by very simple processing.

0052Since the management tool 21 which manages the identifier of the move station 2 made into a communications partner for every access point in this example is established, Also in the case where the access point with which the case where a new access point is added to a system, and the system were equipped is deleted etc., For example, since it is not necessarily required for a router etc. for additional registration etc. to carry out the identifiers (address etc.) of an access point, there is also an advantage that the design variation of a system can be performed easily.

0053Although above-mentioned working example showed here the case where management processing of the move station using communication between the access points concerning this invention and management processing of the move station using a connection timer were used together and carried out, This invention may be performed separately from the move station management processing which used the connection timer, for example. In this case, an access point does not need to be equipped with the function to perform move station management processing which used the connection timer, for example.

0054In above-mentioned working example, while performing radio between the access point and the move station, between an access point and other access points, the composition which carries out information and telecommunications via the circuit of a cable was shown, but. For example, the composition to which radio is carried out may be used between an access point and other access points. As the number of the access point with which a wireless LAN system is equipped, or move stations, it may not necessarily be restricted to what was shown in above-mentioned working example, but the wireless LAN system of this invention may be built with various composition.

Brief Description of the Drawings

Drawing 1It is a figure showing the example of composition of the wireless LAN system concerning one working example of this invention.

Drawing 2It is a figure showing an example of a move station management table.

Drawing 3It is a figure showing the example of composition of the frame which communicates between access points.

Drawing 4It is a figure showing an example of the procedure of connection processing in an access point.

Drawing 5It is a figure showing an example of the procedure of processing using the connection timer in the access point.

Drawing 6It is a figure showing an example of the procedure of processing using the communication between access points in an access point.

Description of Notations

1a-1c .. An access point and 2a-2f .. Move station, 3 .. **A control section and 21 / .. A move**

station management table, 22 / .. A reception means and 23 / .. A reporting means and 24 / .. A registration means, 25 / .. A deleting means and 31 / .. A reporting means and 41 / .. Frame, .. A circuit, R1-R3 .. A communication feasible region and 11 .. A storage parts store, 12

Drawing 1

For drawings please refer to the original document.

Drawing 2

For drawings please refer to the original document.

Drawing 3

For drawings please refer to the original document.

Drawing 4

For drawings please refer to the original document.

Drawing 5

For drawings please refer to the original document.

Drawing 6

For drawings please refer to the original document.

For drawings please refer to the original document.
